

Evaluation of a Local Level Perinatal Hepatitis B Prevention Program

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Abstract

Objective: To examine obstetricians, pediatricians, and delivery room and nursery staff knowledge of perinatal hepatitis B and determine their awareness of a Perinatal Hepatitis B Prevention Program.

Methods: An evaluative survey of perinatal screening and prophylactic practices for HBV among healthcare providers was administered in Health District 4. A total of 48 self-administered surveys were returned. Responses were transferred to an Excel database. Simple statistics were then used to analyze results.

Results: Both current literature and our survey results suggest that perinatal hepatitis B infection in Idaho is uncommon. Provider responses highlight a lack of awareness of CDC guidelines and recommendations, and the existing Central District Health Department (CDHD) Perinatal Hepatitis B Prevention Program.

Conclusion: The survey identified current gaps in reporting and screening practices that may be used to improve existing perinatal hepatitis B prevention strategies. Extended efforts to educate providers regarding reporting procedures and program incentives may assist in improving the current system of care.

Introduction

Central District Health Department (CDHD) receives federal funds through the Idaho Department of Health and Welfare (IDHW) to assist in implementing the Perinatal Hepatitis B Prevention Program. This program is provided to residents throughout the health district in Ada, Boise, Elmore and Valley Counties. The primary objectives of the CDHD Perinatal Hepatitis B Prevention Program are to ensure that all pregnant females are tested for hepatitis B surface antigen (HBsAg), identify pregnant females who are HBsAg-positive, and ensure newborns receive appropriate prophylaxis. The cooperation of the entire medical community is essential in meeting these objectives.

The Perinatal Hepatitis B Prevention Program collaborates with laboratories and medical offices (e.g., obstetricians and pediatricians) to ensure all HBsAg-positive lab reports are sent to CDHD for follow-up. The health department coordinates efforts with the patient's physician, hospital where delivery is anticipated, and pediatrician to ensure all measures are taken to prevent transmission from mother to newborn. Ideally, exposed infants are appropriately treated with hepatitis B immune globulin (HBIG) and hepatitis B vaccine within 12 hours of birth and then go on to complete the hepatitis B series in accordance with CDC recommendations. The program also offers services to household contacts of infected mothers, to ensure that all contacts are tested for hepatitis B virus (HBV) and if found susceptible, receive the hepatitis B vaccine series.

Surveillance programs alone are not sufficient to capture the uptake of or adherence to the respective prevention guidelines so periodic evaluations are warranted. This report details the results of an evaluative survey of perinatal screening and prophylactic practices for HBV among healthcare providers in Health District 4.

Background

The vertical transmission of perinatal infections from mother to child is a major cause of newborn morbidity and mortality. Of the approximately four million births in the United States (U.S.) each year, an estimated 19,000 are born to females who test positive for HBsAg at the time of delivery. The risk of perinatal HBV infection among infants born to HBV-infected mothers ranges from 10% to 90%, depending on the mother's hepatitis B e-antigen (HBeAg) status (Stevens et al., 1985; Xu et al., 1985; “Perinatal Hepatitis B,” 2005). Even when not infected during the perinatal period, children of HBV-infected mothers remain at high-risk of acquiring a chronic HBV infection by person-to-person transmission during the first 5 years of life (Jonas et. al., 1987). More than 90% of these infections can be prevented if HBsAg-positive mothers are identified during pregnancy so that their newborns can receive hepatitis B vaccine and HBIG soon after birth (Stevens et al., 1987; McMahon et al., 1987).

While there are different options to manage perinatal and postnatal HBV exposures, the combination of immunization and HBIG administration at birth is the most effective way to prevent HBV infection (Beasley et al., 1983; Stevens et al., 1987). Unless these newborns receive appropriate post-exposure prophylaxis, exposure can result in transmission of HBV up to 90% of the time (Perinatal Hepatitis B,” 2005). Of those infected, 90% will become chronic carriers and 25% of those will die of chronic liver disease, usually as adults (“Perinatal Hepatitis B,” 2005). Once infected with HBV, hepatitis B vaccine is not effective as a preventive measure or treatment.

In 1987, researchers found that a single dose of hepatitis B vaccine and one dose of HBIG, administered within 24 hours after birth was 85% to 95% effective in preventing HBV

infection. Hepatitis B vaccine administered alone in a three dose series (first within 24 hours after birth, then 1-2 months of age, and at 6 months of age) is 70% effective in preventing perinatal HBV infections (Stevens et al., 1987; McMahon et al., 1987). In 1988, the CDC released a recommendation, advising that all pregnant females be tested for HBsAg during the prenatal period (CDC, 1990). This recommendation was based on research findings that indicated that selective screening of pregnant females for HBsAg was not effective in identifying a high proportion of HBV-infected mothers (Kumar et al., 1987; CDC, 1994). Also in 1988, the CDC recommended that all infants born to HBsAg-positive females receive post-exposure prophylaxis consisting of HBIG (0.5 mL, IM) and single-antigen hepatitis B vaccine (0.5 mL, IM) at separate injection sites within 12 hours of birth. The second and third doses should be given 1 month and 6 months after the first. This multistep process requires effective transfer of information among several groups of healthcare providers, knowledge of recommended treatment, and availability of HBIG and vaccine at separate facilities (CDC, 1988).

Females who have been admitted for delivery and have not had prenatal HBsAg testing complicate clinical management. In these cases, initiating hepatitis B vaccination at birth will provide adequate post-exposure prophylaxis if the mothers are indeed HBsAg positive. Follow-up testing for hepatitis B surface antibody (anti-HBs) and HBsAg at 9-15 months of age will determine the success of the therapy. This follow-up testing will also identify HBV carriers or infants who may require additional doses of hepatitis B vaccine (Jilg, Schmidt, & Dienhardt, 1989).

This comprehensive strategy to prevent perinatal HBV infection in the U.S. has dramatically decreased transmission from mother to newborn. Locally, routine visits for prenatal and well-child care must be used to target hepatitis B prevention. Screening and vaccination

programs for females and infants receiving care in the public sector have been initiated through state immunization projects such as the Idaho Immunization Program, Idaho Immunization Reminder Information System and the CDHD Perinatal Hepatitis B Prevention Program.

Methods

An evaluative survey of perinatal screening and prophylactic practices for HBV among healthcare providers was administered in Health District 4. This survey was specifically designed to evaluate three populations that included obstetrician, pediatrician, and delivery room and nursery staff. The intent was to analyze each of these groups practice patterns and knowledge regarding the Perinatal Hepatitis B Prevention Program as well as adherence to CDC hepatitis B perinatal guidelines.

Study Population and Method of Survey Distribution

This survey was conducted throughout Ada, Boise, Elmore and Valley Counties using two approaches, obstetricians and pediatricians in the health district were identified through the Idaho Medical Association (IMA). Delivery and nursery room staff were identified through local hospitals known to provide a labor and delivery capability.

Obstetrician and pediatrician surveys were distributed by mail and physicians had the opportunity to return surveys by mail or to complete the survey online. Delivery room and nursery staff at four local hospitals were invited to participate in a telephone survey.

Survey Design

The obstetrician survey consisted of eight questions regarding practice patterns and knowledge ascertainment. The pediatrician survey consisted of five questions regarding both practice pattern and knowledge ascertainment. Lastly, the delivery room and nursery staff survey consisted of five questions also related to practice patterns and knowledge ascertainment. These

surveys were constructed by CDHD staff and subjected to two rounds of peer review before distribution (Table 1).

The surveys contained a combined total of 14 practice pattern related questions and the same two-part knowledge-related question, while the obstetricians were asked one additional knowledge-related question.

Table 1: Survey Questions

Practice Pattern Questions and Answers	
Questions	Response Options
<i>All</i>	
1. I am aware that CDHD has a perinatal hepatitis B virus (HBV) prevention program. a) If yes, rate the program...Excellent, Good, Fair, Poor or Unknown.	1. Yes, No a) Excellent, Good, Fair, Poor, Unknown
<i>Obstetricians</i>	
1. There is a standard protocol in my practice for following pregnant patients with acute or chronic HBV to ensure the infection is not passed onto the newborn at birth.	1. Strongly Agree, Agree, Disagree, Strongly Disagree
2. I routinely screen my patients for HBV (HBsAg & HBeAg) during their first pregnancy.	2. Strongly Agree, Agree, Disagree, Strongly Disagree
3. I routinely screen my patients for HBV (HBsAg & HBeAg) during subsequent pregnancies.	3. Strongly Agree, Agree, Disagree, Strongly Disagree
4. I use a risk-based approach to screening pregnant patients for HBV.	4. Strongly Agree, Agree, Disagree, Strongly Disagree
5. I communicate HBV status to the delivery room/nursery prior to or at the time of birth.	5. All of the time, Some of the time, Rarely, Never
6. I communicate HBV status/risk to the patient's pediatrician.	6. All of the time, Some of the time, Rarely, Never
<i>Pediatricians</i>	
1. My practice has an established protocol for identifying and ensuring comprehensive care for babies born to HBsAg-positive or HBeAg-positive mothers.	1. Strongly Agree, Agree, Disagree, Strongly Disagree
2. I am typically notified about a patient's HBV status and/or risk by (select all that apply).	2. Delivery room, Lab testing accomplished through my clinic, Mother, CDHD, Other
3. My practice ensures that the hepatitis B vaccine series is completed as recommended for newborns born to mothers with acute or chronic HBV.	3. Strongly Agree, Agree, Disagree, Strongly Disagree

4. I routinely screen for HBV (HBsAg) after the series is completed.	4. Strongly Agree, Agree, Disagree, Strongly Disagree
<i>Delivery Room/ Nursery Staff</i>	
1. The delivery room/nursery has a protocol for screening/verifying the HBV status of the mother.	1. Strongly Agree, Agree, Disagree, Strongly Disagree
2. The delivery room/nursery has HBIG and the hepatitis B vaccine on hand for preventing the spread of HBV from mother to newborn.	2. Strongly Agree, Agree, Disagree, Strongly Disagree
3. The delivery room/nursery takes proactive measures to ensure that the patient, patient's physician, and pediatrician know the HBV status of the mother and the risk to the child if follow-up does not occur.	3. All of the time, Some of the time, Rarely, Never
4. The delivery room/nursery takes proactive measures to ensure that the patient, patient's physician, and pediatrician know what measures are taken at the hospital to prevent the transmission of the virus.	4. All of the time, Some of the time, Rarely, Never
Knowledge Questions	
<i>Obstetricians</i>	
1. Acute and chronic HBV infections in pregnant patients may cause miscarriages, stillbirths, or severe illness in the newborn as well as long-term sequelae.	1. Strongly Agree, Agree, Disagree, Strongly Disagree

Data Analysis

Self reported data from returned surveys and the telephone surveys were entered into an Excel database for analysis. Data entry was verified by a second party to ensure quality of the dataset. Responses for every study question were analyzed for each independent study group. Cumulative percentages were calculated for each categorical response. Where possible, comparative analyses of the responses between the study groups (e.g., obstetricians, pediatricians, and delivery room and nursery staff) were accomplished.

Results

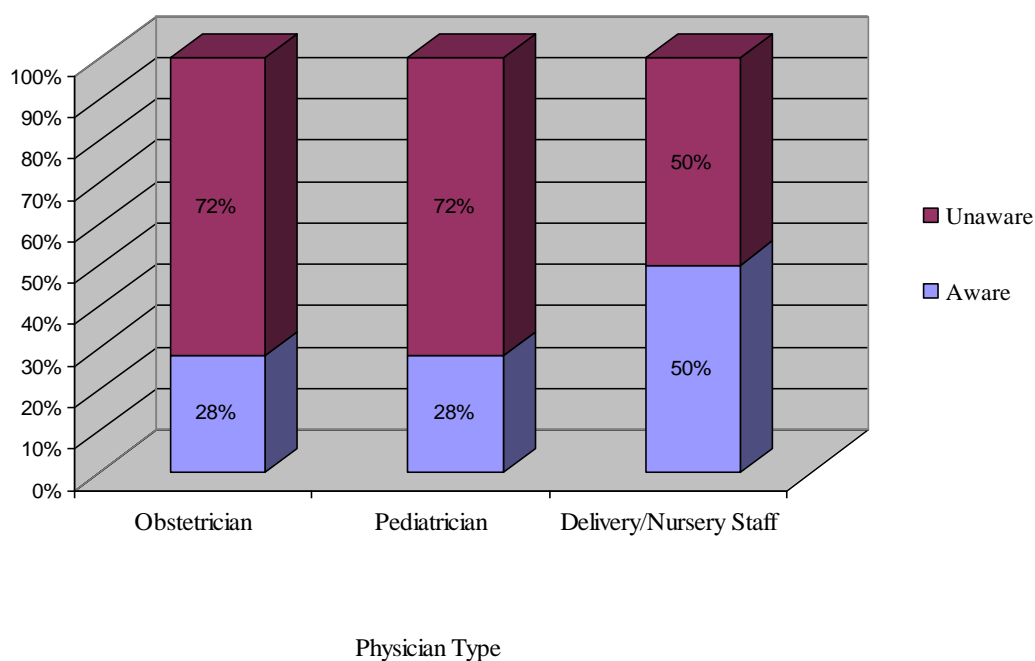
Survey Return

A total of 18 (24%) out of 75 surveys sent to obstetricians, 26 (30.5%) out of 85 surveys sent to pediatricians and all of the surveys (N=4) administered to delivery room and nursery staff were completed for an overall response rate of approximately 29%.

Program Perceptions

When asked whether physicians were aware that CDHD had a perinatal hepatitis B virus prevention program, 28% of obstetricians, 27% of pediatricians and 50% of delivery room/nursery staff respondents reported knowledge of the program (Fig. 1). If participants responded that they knew of the program, they were then asked to rate the program. Of those that had existing knowledge of the program, 7% rated it as “Excellent”, 36% rated it as “Good” and 7% rated the program as “Fair.”

Figure 1: CDHD Perinatal Program Awareness



Protocols

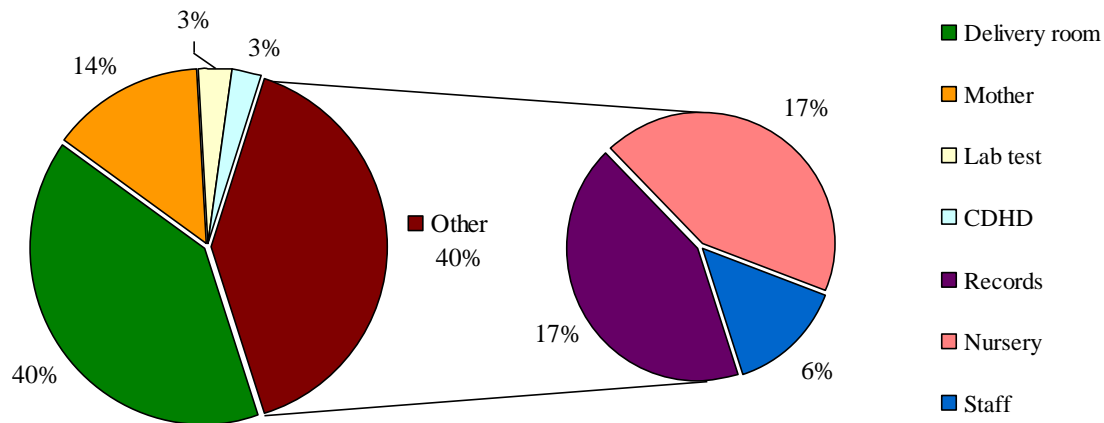
When obstetricians were asked, “my practice has a standard protocol for following pregnant patients with acute or chronic HBV infection to ensure the infection is not passed onto their newborn”, 41% of respondents agreed while 24% disagreed. When asked whether obstetricians routinely screened their patients for HBV during their first pregnancy and during subsequent pregnancies, 72% strongly agreed and 11% strongly disagreed. When asked if obstetricians use a risk-based approach to screening pregnant patients for HBV 6% agreed and 67% strongly disagreed. When obstetricians were asked whether they communicate HBV status to the delivery room or nursery, 94% of respondents stated that they do “All of the time” and when asked if they communicate HBV status or risk to the patient’s pediatrician, 81% stated that they do “All of the time.”

When pediatricians were asked whether their practice had an established protocol for identifying and ensuring comprehensive care for babies born to HBsAG-positive mothers 31% strongly agreed, 58% agreed, 8% disagreed and 8% strongly disagreed. These responses exceed 100% because one respondent gave two answers.

When pediatricians were asked how they were typically notified about a patient’s HBV status or risk, 40% answered they were notified in the delivery room. The next most common answer was either from the nursery or some form of medical records (17%) (Fig. 2).

Sixty two percent of pediatricians strongly agreed that their practice ensures that the hepatitis B vaccine series is completed as recommended for newborns born to mothers with acute or chronic HBV infection and 21% strongly agreed that they screen for HBV immunity after the series is completed.

Figure 2: Pediatrician reported methods of notification of HBV status or risk of patients



Note: The overall response rate exceeds 100% because the survey allowed for multiple choices to this question.

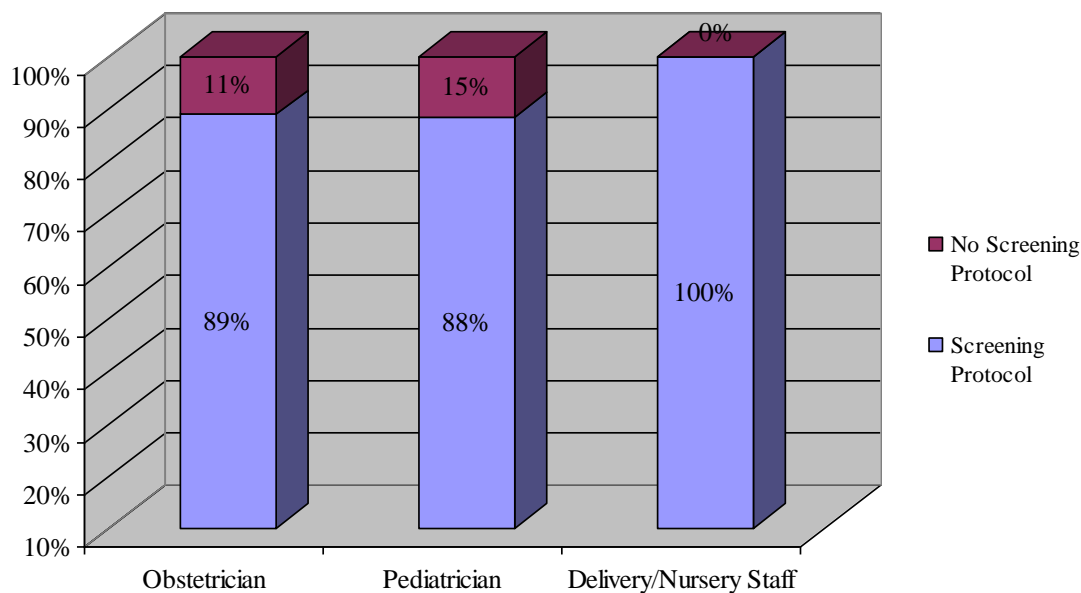
Half (50%) of delivery room and nursery staff indicated that they have a protocol for screening or verifying the HBV status of the mother. All (75% strongly agreed and 25% agreed) of delivery room and nursery staff reported that they had hepatitis B vaccine on hand. In addition, all delivery room or nursery staff reported taking proactive measures to ensure that the patient, patient's obstetrician and the patient's pediatrician knew the HBV status of the mother. Delivery room or nursery staff also reported that all parties were aware of subsequent risk to the child or that they knew what measures were taken at the hospital to prevent the transmission of the virus.

Practice Patterns and Knowledge Ascertainment

All obstetricians reported knowing that acute and chronic HBV infections in pregnant patients may cause miscarriages, stillbirths, or severe illness in the newborn as well as long-term sequelae.

Delivery room and nursery staff were more likely to screen for vaccine-preventable diseases as part of their standard of care than were pediatricians and obstetricians (Fig. 3).

Figure 3: Screening Protocols for Vaccine Preventable Diseases



Note: The overall response rate of Pediatricians exceeds 100% because one respondent gave two answers.

Discussion

Both our survey and current literature suggest that perinatal hepatitis B infection in Idaho is uncommon. Two physicians in our surveys commented that they had never seen a case of perinatal hepatitis B infection throughout their time in practice. While perinatal infection in Idaho is uncommon, provider responses highlight some lack of awareness regarding CDC guidelines and recommendations and existing CDHD Perinatal Hepatitis B Prevention Program.

Limitations of the survey include a low response rate. Therefore, the findings of this research may not be generalizable to other communities with Perinatal Hepatitis B Prevention Programs. An important limitation to note is the lack of demographic data to adequately describe

the respondents (i.e., number of years in practice, profession [e.g., nurse, doctor, PA, etc.], rural providers, age and gender). Reporting biases may have come into play, but could not be identified since no demographic data were collected.

In summary, this survey identified current gaps in reporting and screening practices that may be used to improve existing perinatal hepatitis B prevention strategies. Some studies suggest the primary reason for not offering vaccines is the cost of vaccination and the belief that vaccine administration is not the responsibility of the health care provider (Schrag et al., 2003; Gonik, Jones, Contreras, Fasano & Roberts, 2000). The high proportion of physicians who do not offer vaccines or screen for immunity, because of vaccination or history of infection, suggests missed opportunities for prevention of maternal and neonatal infections (Schrag et al., 2003). Enhanced efforts to educate providers regarding reporting procedures and program incentives may assist in improving the current system of care.

The Perinatal Hepatitis B Prevention Program is a highly unknown and underutilized resource in the health care community. Efforts to educate health care providers about the existence and services the program provides is necessary. The Perinatal Hepatitis B Prevention Program could better serve the health care community and the public's health by facilitating the implementation of a protocol that outlines a consistent standard of practice across provider clinics. This single change may be the quickest and easiest way to increase the odds of detecting females infected with HBV and decrease the risk of transmission to newborns in Health District 4. Enhanced communication between obstetricians, pediatricians, and delivery room and nursery staff may also decrease the risk for a break down in continuity of care. Additional research is needed to track trends and determine specific gaps in service delivery.

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